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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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MINTZ, LEVIN, COHN, FERRIS, GLOVSKY AND POPEO, P.C
ONE FINANCIAL CENTER
BOSTON, MA 02111

EXAMINER	
GOINS, DAVETTA WOODS	
ART UNIT	**PAPER NUMBER**
2612	

MAIL DATE	DELIVERY MODE
02/03/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/564,587	DOUGHTY ET AL.	
	Examiner	Art Unit	
	Davetta W. Goins	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 November 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-64* is/are pending in the application.

4a) Of the above claim(s) *9-14,30-32 and 50-64* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,15-29,33-45,49 and 57* is/are rejected.

7)☒ Claim(s) *46-48* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-8, 15-29, 33-49 and 57 (claims 1-7 and 57 were erroneously omitted from the Election/Restriction) in the reply filed on November 19, 2009 is acknowledged.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-8, 15-20, 23-29 are rejected under 35 U.S.C. 102(e) as being anticipated by Orava et al. (US Pat. 6,856,350).

In reference to claims 1, 23, 24, Orava discloses a) the claimed detector substrate for generating electronic charge responsive to incident ionising radiation, the detector substrate configured to form an array of ionising radiation sense volumes, which is met by single semiconductor substrate 16 including volumes 19/20 (Figure 1), b) the claimed circuit substrate supporting an array of read-out circuits corresponding to the array of sense volumes: wherein each of the read-out circuits is switchable between

first and second charge integration modes for receiving charge from a corresponding sense volume, and includes a charge integration circuit configured in the first charge integration mode to integrate charge corresponding to sensing of a single ionising radiation detection event in a corresponding sense volume and configured in the second charge integrating mode to integrate charge corresponding to sensing a plurality of ionising radiation detection events in the corresponding sense volume, which is met by active pixel circuits 20 can be constructed integrally to the semiconductor substrate 16 on the pixel cells 18 as part of the semiconductor processing. A charge accumulation process in an active pixel circuit 20 continues until control signals are issued from control electronics 24 to start a process of reading out information by addressing each pixel cell, effectively in a random access manner, from each individual pixel cell. During readout of the accumulated charge values, charge continues to be accumulated because the readout is always done individually for detecting pixel cells (col. 11, lines 59-67; col. 12, lines 1-30). Read bit thus ripples through the switches SW4-SW1 and flip-flops U1-U4 for successive clock pulses of the clock CLK. The column enable flip flops U1-U4 form a first shift register (col. 17, lines 4-37).

In reference to claims 2-4, 27-29, Orava discloses the claimed the read-out circuits comprises first and second capacitances, each of the read-out circuits switchable between the first and second modes for accumulating charge in first and second

capacitances respectively, which is met by accumulating devices are an integrated capacitor or the gate of an integrated transistor (col. 12, lines 5-30).

In reference to claim 5, Orava discloses the claimed capacitance in the second mode comprises a first capacitor and second capacitor, the assembly operative to accumulate charge on the first capacitor alone and to switchably couple the second capacitor to the first capacitor for providing a greater capacitance near to saturation of the first capacitor, which is met by the total parasitic capacitance of the detector and the other elements in each pixel circuit and corresponding pixel detector is in the range of a few fF or tens of fF. The capacitance of the charge storage device should be maximized and in any case be substantially bigger than the parasitic capacitance in each pixel cell (col. 13, lines 8-35).

In reference to claims 6, 7, Orava discloses the claimed read-out circuits comprise means for switching between the first and second modes, which is met by the pixels are read out sequentially in a predetermined order, it will be appreciated that the pixels are in effect accessed in a random access manner by means of separate row and column enable signals. Read bit thus ripples through the switches SW4-SW1 and flip-flops U1-U4 for successive clock pulses of the clock CLK. The column enable flip flops U1-U4 form a first shift register (col. 16, lines 42-67; col. 17, lines 1-37).

In reference to claim 8, Orava discloses the claimed circuits comprise reset circuitry for discharging the capacitances subsequent to read-out of charge thereon, which is met by pixel circuits may selectively be reset after readout to discharge the charge accumulation circuit elements, RES-R-1 is a reset input and ENA-R-1 is an enable input for the pixel circuit (col. 12, lines 31-67; col. 13, lines 1-7).

In reference to claims 16, 17, Orava discloses the claimed conductive material disposed over a first surface of the detector substrate, and an array of conductive pads formed over a second surface of the detector substrate opposing the first surface for forming the array of the sense volumes, and wherein each of the array of conductive pads is electrically coupled to corresponding ones of the array of charge storage circuits of the circuit substrate, which is met by wire bond pads 220 on the supporting layer or board 210 permit the electrical connection of the readout chip to circuitry on the board 210 and from there via a master back plane to image processing circuitry (col. 22, lines 38-67).

In reference to claims 18, 19, Orava discloses the claimed semi-conductor material comprises one of cadmium telluride, cadmium zinc telluride, silicon, amorphous silicon or Gallium Arsenide, which is met by a single semiconductor substrate (e.g., silicon) (col. 11, lines 36-44).

In reference to claim 20, Orava discloses the claimed circuit substrate supports CMOS circuitry, which is met by silicon substrate 1. Electrodes for the source 3 and drain 5 are formed in an oxide layer 2, a gate electrode 7 being formed over the oxide layer 2 (col. 12, lines 31-58).

In reference to claim 25, Orava discloses the claimed substrate to receive charge from the ionising radiation detector substrate, the circuit substrate comprising an array of read-out circuits including photon counting circuitry electronically configurable to respond to a current pulse corresponding to the detection in a detector substrate of ionising radiation in a first energy range to increment a first count value or to respond to a current pulse corresponding to the detection in a detector substrate of ionising radiation in a second energy range to increment a second count value, which is met by the charge created from each and every photon or charged radiation particle is first stored in the active circuits of the pixel cells and then read out. The control electronics digitizes the charge and the DRP can compare the digitized value to a threshold reference value (col. 28, lines 19-44).

In reference to claim 26, Orava discloses the claimed method comprising: a) integrating charge corresponding to sensing of a single ionising radiation event; and b) non-coincidental with step a) integrating charge corresponding to sensing of multiple ionising radiation events, which is met by examples of possible accumulating devices are an integrated capacitor or the gate of an integrated transistor.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 21, 22 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orava et al.

In reference to claims 21, 22, 57, although Orava does not specifically disclose the claimed sense volumes comprise a cross-section area in the range between 20 μm x 20 μm x 0.25 mm to 2 mm x 2 mm x 5 mm, or the claimed the cross-sectional surface area of each of the conductive pads is in the range 15 μm x 15 μm to 1.95 mm x 1.95 mm, he does disclose the active pixel circuit 20 and the pixel detector 19 can be of the order of a few tens of microns in size (e.g., 10-50 μm) (col. 11, lines 45-58). Ovara also discloses wire bond pads 220 on the supporting layer or board 210 permit the electrical connection of the readout chip to circuitry on the board 210 and from there via a master back plane to image processing circuitry (col. 22, lines 38-67). Since Ovara discloses volumes 19 as well as electric bond pads, it would have been obvious to one of ordinary skill in the art at the time of the invention to use any size necessary to ensure that the radiation will be detected.

6. Claims 33-45 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orava et al. in view of Frank (US Pat. 7,005,982 B1).

In reference to claim 33, 35-44, 49, Orava does not disclose the claimed assembly is part of an ionising radiation monitoring device in a radiation monitoring network, the network further comprising: a communications unit for communicating at least radiation data corresponding to radiation sensed by the device over a communications network; and a control station configured to receive the radiation data from the device. However, Orava discloses a system that detects radiation and includes a read out every 32 msec with a multiplexer clock rate of 10 MHz. Thus, in this example with just one readout channel, one frame will be displayed every 32 msec offering real time imaging (col. 18, lines 1-30). Frank discloses a detection device 410, 408 detects a hazardous material, the local processor 402 recognizes the alarm, identifies the hazardous materials (such as radiation), quantifies the hazardous materials provides a local alarm and generates a local alarm message. The wireless or wire-line unit within the local processor sends an alarm message over the wireless or wire-line link 420, 416. The alarm data provides the GPS positioning obtained through the GPS antenna 418 and GPS processor 402, the hazardous material identification and measurement 410 and 408 the time and date and the carrier security system identification number (col. 7, lines 30-63). Since Orava discloses a system that detects radiation and gives an output, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teaching of including a network including a

communications unit, as disclosed by Frank, with the system of Orava, to provide an indication at a remote location that will notify users of detected radiation.

In reference to claims 34, 45, Orava does not specifically disclose the claimed at least one device is configured to provide radiation data including spectroscopic data representative of the energy of the sensed radiation, and to transmit the spectroscopic data to the control station. However, Orava discloses an array of ionising radiation sense volumes, which is met by single semiconductor substrate 16 including volumes 19/20 (Figure 1). Frank discloses a sensor device 706 could be a Calspec tester, a mass spectrometer, etc. The computer device 712 analyzes the output from the sensor 706 to detect, identify and measure the elements paced in the sensor device (col. 6, lines 10-27). Frank also discloses a detection device 410, 408 detects a hazardous material, the local processor 402 recognizes the alarm, identifies the hazardous materials (such as radiation), quantifies the hazardous materials provides a local alarm and generates a local alarm message. The wireless or wire-line unit within the local processor sends an alarm message over the wireless or wire-line link 420, 416. The alarm data provides the GPS positioning obtained through the GPS antenna 418 and GPS processor 402, the hazardous material identification and measurement 410 and 408 the time and date and the carrier security system identification number (col. 7, lines 30-63) Since Orava discloses a system that detects radiation and gives an output, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teaching of including spectroscopic data and provide it to a

central station, as disclosed by Frank, with the system of Orava, as a means for taking into consideration various types of hazards that are detected and can be distinguished and provide an indication at a remote location that will notify users of detected radiation.

Allowable Subject Matter

7. Claims 46-48 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The prior art of record and not relied upon is considered pertinent to the applicant's disclosure as follows. Francke (US Pat. 6,337,482 B1), Shahar et al. (US Pat. App. 2002/0036269 A1), Lingren et al. (US Pat. App. 2002/0079456 A1), Sussmann et al. (US Pat. 6,707,045 B1), Yokoi et al. (US Pat. App. 2005/0098730 A1), and Gerstenmayer et al. (US Pat. 7,196,333 B1), which disclose radiation detectors.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Davetta W. Goins whose telephone number is 571-272-2957. The examiner can normally be reached on Mon-Fri with every other Fri. off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Lee can be reached on 571-272-2963. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Davetta W. Goins/
Primary Examiner
Art Unit 2612